GREENSTAR CDi

WALL HUNG RSF GAS-FIRED CONDENSING BOILER

THE APPLIANCE IS FOR USE WITH
NATURAL GAS OR L.P.G. (Cat II 2H3P TYPE C13 & C33)

WORCESTER GREENSTAR 25CDi Combi	GC NUMBER 47-311-92
WORCESTER GREENSTAR 30CDi Combi	GC NUMBER 47-311-93
WORCESTER GREENSTAR 35CDi Combi	GC NUMBER 47-311-94
WORCESTER GREENSTAR 40CDi Combi	GC NUMBER 47-311-95
WORCESTER GREENSTAR 30CDi Conventional	
WORCESTER GREENSTAR 40CDi Conventional	

GB/IE

SERVICE BOOKLET
FOR THE ENGINEER

benchmark

WORCESTER
Bosch Group

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Safety precautions

Repairs

- ▸ Repairs may only be carried out by an approved installer (such as British Gas or CORGI registered personnel)!
- ▸ Before carrying out any work on the appliance, isolate mains supply before starting any work and observe any safety precautions!
- ▸ Even when the appliance is switched off at the mains supply, some components on the pcb inside the control box are still live.
  Therefore:
- ▸ Before carrying out any work on the electrical parts of the appliance fully disconnect it from the power supply (e. g. by means of fuse or circuit breaker)!
- ▸ Flue ducting must not be modified in any way.
- ▸ Use only original spare parts!

Instructions to the customer

- ▸ Advise the customer that he/she must not make any modifications to the appliance or carry out any repairs on it.
- ▸ Draw attention to the need for an annual service (or maintenance contract if applicable).

Symbols

Safety instructions in this document are identified by a warning-triangle symbol and are printed on a grey background.

Signal words indicate the seriousness of the hazard in terms of the consequences of not following the safety instructions.

- **Caution** indicates that minor damage to property could result.
- **Warning** indicates that minor personal injury or serious damage to property could result.
- **Danger** indicates that serious personal injury could result. In particularly serious cases, lives could be at risk.

Notes are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.

Notes contain important information in cases where there is no risk of personal injury or damage to property.

1 Layout of Appliance

1.1 Combi appliances

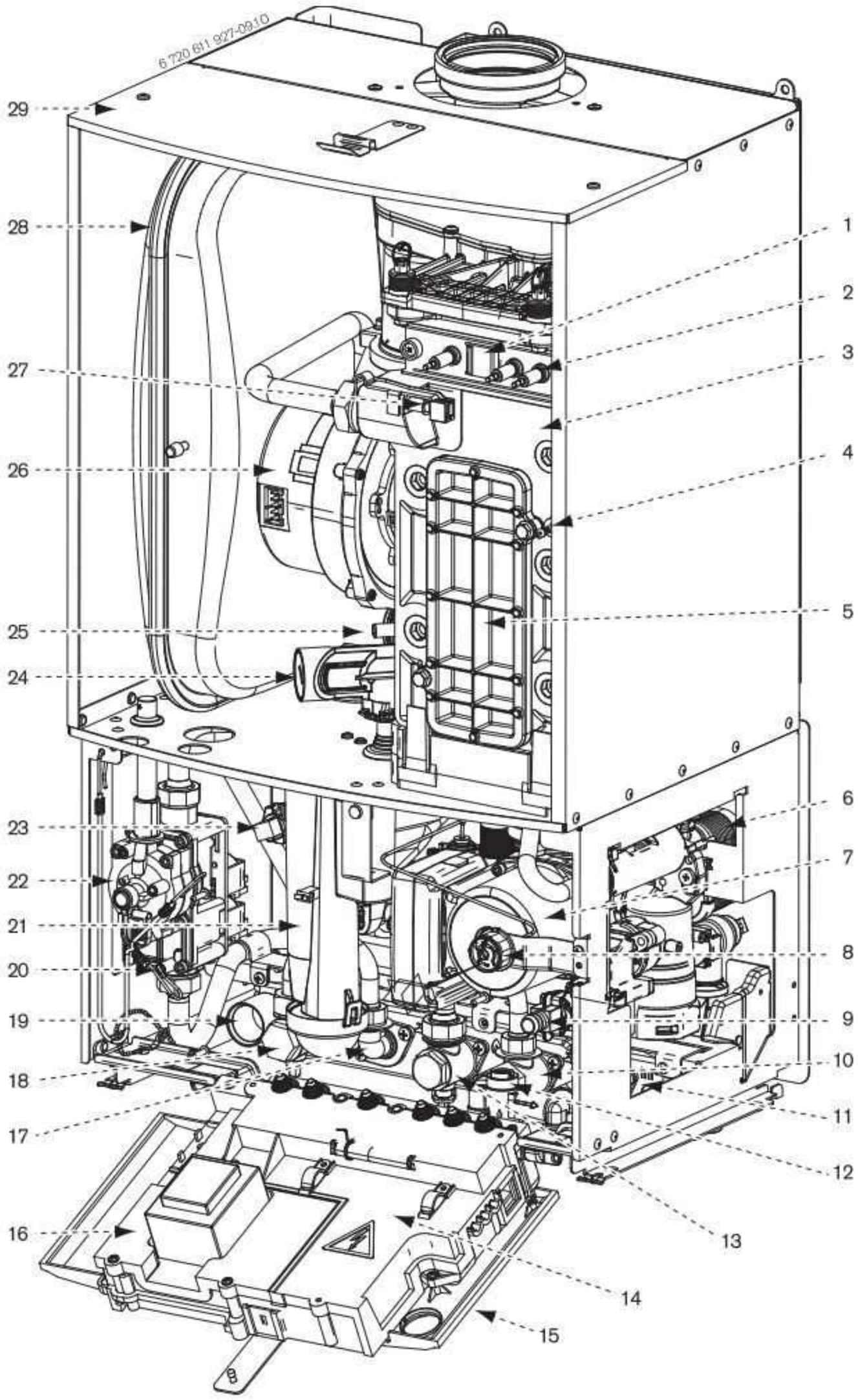

Fig. 1

The diagram shows the controls in the servicing position and excludes the outer case and fascia panel.

1 Flame viewing window
2 Ignition electrode and flame sense electrode
3 Heat exchanger
4 Overheat thermostat
5 Access point for cleaning heat exchanger
6 Plate to plate dhw heat exchanger
7 Pump
8 System pressure gauge
9 Drain point
10 Mains cold water in
11 CH return
12 Charging link assembly (optional)
13 Gas inlet connection 22 mm compression
14 Cover for external wiring connections
15 Control panel in service position
16 Access cover for transformer & PCB
17 DHW out
18 CH flow
19 Trap / syphon outlet connection (22 mm plastic pipe)
20 Inlet pressure test point
21 Trap / syphon
22 Gas valve
23 DHW temperature sensor
24 Air / gas adjustment screw
25 Testing point for fan pressure
26 Fan
27 Primary sensor
28 Expansion vessel
29 Removable top case panel for servicing

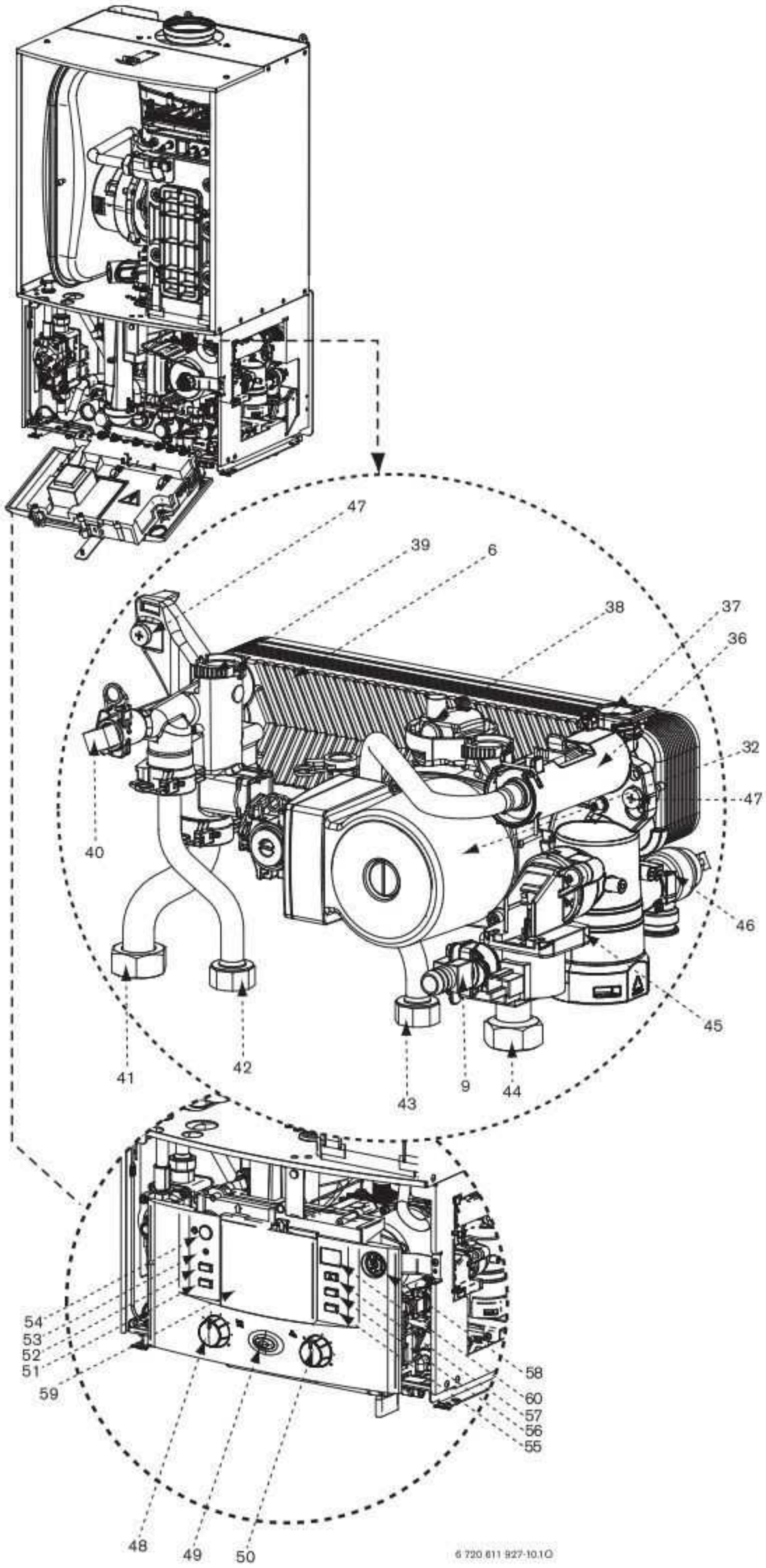

Fig. 2

6	Plate to plate dhw heat exchanger
9	Drain point
32	System pump
36	Flow turbine
37	Unused port
38	Auto air vent
39	Flow connection from boiler heat exchanger
40	DHW sensor
41	CH flow connection to service valve
42	DHW out connection
43	Cold water in connection
44	CH return connection to service valve
45	Diverter valve
46	Pressure relief valve
47	Compact hydraulic mounting screw (2) to boiler
48	CH temperature control
49	Mains on/off indicator/diagnostic light (blue)
50	DHW temperature control
51	Central heating boost button
52	Service button
53	Burner on indicator light (green)
54	Master switch on/off
55	Holiday button
56	ECO button
57	Fault reset button
58	System pressure gauge
59	Position for optional programmer
60	Display

1.2 Conventional appliances

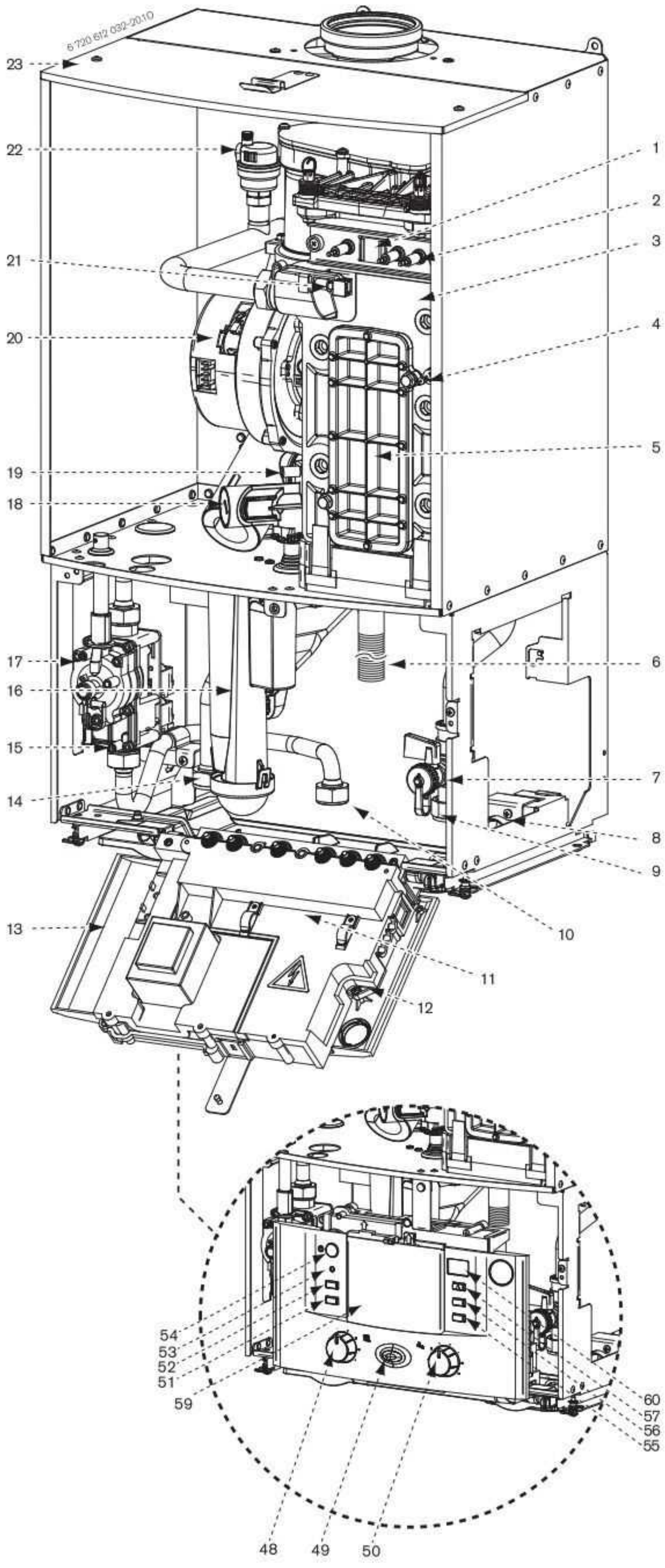

Fig. 3

The diagram shows the controls in the servicing position and excludes the outer case and fascia panel.

1 Flame viewing window
2 Ignition electrode and flame sense electrode
3 Heat exchanger
4 Overheat thermostat
5 Access point for cleaning heat exchanger
6 Condensate hose
7 Drain point
8 Trap / syphon outlet connection (22 mm plastic pipe)
9 CH return
10 Gas inlet connection 22 mm compression
11 Cover for external wiring connections
12 Control panel in service position
13 Access cover for transformer & PCB
14 CH flow
15 Inlet pressure test point
16 Trap / syphon
17 Gas valve
18 Air / gas adjustment screw
19 Testing point for fan pressure
20 Fan
21 Primary sensor
22 Auto air vent
23 Removable top case panel for servicing
48 CH temperature control
49 Mains On/off indicator/diagnostic light (blue)
50 Not used
51 Central heating boost button
52 Service button
53 Burner on indicator light (green)
54 Master switch on/off
55 Holiday button
56 ECO button
57 Fault reset button
58 System pressure gauge
59 Position for optional programmer
60 Display

2 Operation

2.1 Initialisation

When it is switched on, the appliance performs a self-test which takes about 10 seconds.

While the test is in progress, the display shows for the first two seconds 88. Additionally buttons and light up orange and the **reset** button lights up red. Afterwards the display shows the CH flow temperature.

On completion of the test sequence the appliance is ready for operation.

2.2 Display messages

The 7-Segment-Display has following display messages (tabel 1 and 2):

Displayed value	Description	Range
digit, dot followed by letter	Service function	
letter followed by digit or letter	Error code	
two digits	decimal value e.g. flow temperature	00..99
U followed by 0..9	decimal value; 100..109 will be displayed as U0..U9	0..109
one digit (long displayed) followed by twice two digits (short displayed)	decimal value (triple-digit); first digit will be displayed alternating with two last digits (e.g.: 1...69..69 for 169)	0..999
two dashes followed by twice two digits	code plug number; the value is displayed in 3 steps: 1. two dashes 2. two first digits 3. two last digits (e.g.: -- 10 04)	1000.. 9999
two letters followed by twice two digits	version number; the value is displayed in 3 steps: 1. two first letters 2. two first digits 3. two last digits (e.g.: CF 10 20)	

Table 1 Display messages

Special messages	Description
8-	Key acknowledgement after pressing one button (except **reset** button)
--	Key acknowledgement after pressing two buttons simultaneously
C	Key acknowledgement after pressing button longer than 3 sec (storage function)
- -	The display shows alternatively the CH flow temperature and - -. The appliance works continuously at the minimum power (see service function **2.F**).
= =	The display shows alternatively the CH flow temperature and = =. The appliance works continuously at the maximum power (see service function **2.F**).
o	Appliance is in Air purge mode, see service function **2.C.**
H	The display shows alternatively the CH flow temperature and H. The Siphon-fill programme is active. See service function **4.F**.
SE	The display shows alternatively the CH flow temperature and SE reminding next service is due. The burner service intervall of 2324 hours has run out. See service function **5.A**.
H	The display shows alternatively the CH flow temperature and H. The pump is blocked. See error E9.
C	The display shows alternatively the CH flow temperature and C. The gradient limitation is active. The primary temperature is rising too fast and the burner has switched off for 2 minutes. See error E9.

Table 2 Special display messages

2.3 Operating elements

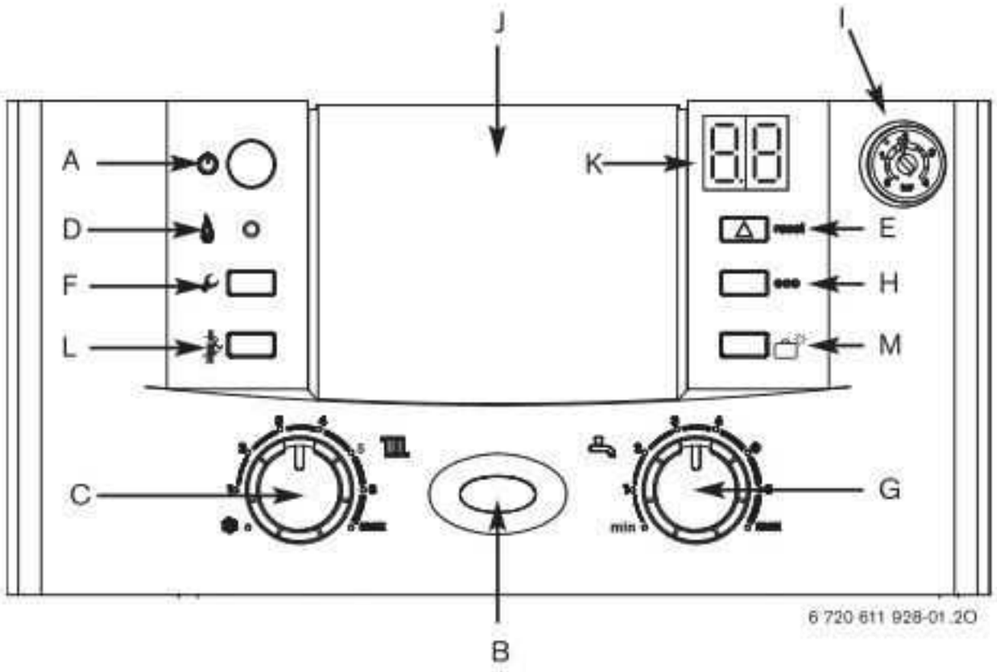

Fig. 4

A On/off button
B On/off and fault indicator (BLUE)
C Central heating temperature control
D Burner indicator (GREEN)
E Reset button (RED)
F Service button (ORANGE)
G DHW temperature control
H ECO button (GREEN) (in service mode for selecting upwards)
I System pressure gauge
J Cover or optional programmer
K Display
L Central heating boost button (ORANGE) (in service mode for displaying and storing values, for selection of max. or min. heat output)
M Holiday button (GREEN) (in service mode for selecting downwards)

Modifications of appliance parameters become active only after storage.

2.4 First service level

2.4.1 Display the value of the service function

- ▶ Press the button for approx.10 sec (the display shows -). When the button will light up orange, release it. In the display appears Digit.Letter e. g. 1.A.
- ▶ Press the button **eco** for going upwards or the button for going downwards to select the service function.
- ▶ Press the button and release it. After releasing the button will light up orange. The display shows the value of the service function.

2.4.2 Set and store values in the service function

- ▶ Display the value of the service function.
- ▶ Press the button **eco** for going upwards or the button for going downwards to select the value.
- ▶ Press the button longer than 3 sec until [ ] appears on the display. After releasing the button goes out and the value is stored. The first service level is active.

2.4.3 Exit service function/service level without storing

- ▶ Press the button to exit the service function without storing. After releasing the button goes out.
- ▶ Press the button to exit service level. After releasing the button goes out. The display shows the flow temperature.

2.5 Second service level

2.5.1 Display the value of the service function

- ▶ Press the button for approx.10 sec (the display shows -). When the button will light up orange, release it.
- ▶ Press buttons **eco** and simultaneously for 3 sec (the display shows - -) until in the display appears Digit.Letter e. g. 8.A.
- ▶ Press the button **eco** for going upwards or the button for going downwards to select the service function.
- ▶ Press the button and release it. After releasing the button will light up orange. The display shows the value of the service function.

2.5.2 Set and store values in the service function

- ▶ Display the value of the service function.
- ▶ Press the button **eco** for going upwards or the button for going downwards to select the value.
- ▶ Press the button longer than 3 sec until [ ] appears on the display. After releasing the button goes out and the value is stored. The second service level is active.

2.5.3 Exit service function/service level without storing

- ▶ Press the button to exit the service function without storing. After releasing the button goes out. First service level is active.
- ▶ Press buttons **eco** and simultaneously for 3 sec (the display shows - -) in order to go to the first service level. Afterwards the display shows the last selected service function.

-or-

- ▶ Press the button to exit all service levels. After releasing the button goes out.

2.6 Resetting service functions to factory settings

To reset all settings on Service levels **1 and 2** to the factory settings:

- ▶ Display the value of the service function **8.E** (second service level, value = 0) and store it. The appliance restarts with factory settings (see also section 2.1).

2.7 Select max. or min. heat output

- ▸ Press the button for approx.10 sec (the display shows -). When the button will light up orange, release it.
- ▸ Turn the CH kontrol knob on the right and adjust maximum heat output (the display shows alternatively the CH flow temperature and).

-or-

- ▸ Turn the CH kontrol knob on the left and adjust minimum heat output (the display shows alternatively the CH flow temperature and).
- ▸ Press the button to exit the function. After releasing the button goes out.

Max. or min. heat output is active for only 15 min. Afterwards the appliance changes to normal mode.

2.8 Reset the appliance

- ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts without parameter reset. (For a parameter reset see section 2.6).

3 Boiler service functions

3.1 First service level (pressing the button for approx. 10 sec)

	Description	Display	Range adjustable from - to/ Description	Reset Value (after parameter reset)
1.A	Max. output (heating)	*-U0	min adjustable output - 100%	depends on appliance type
1.b	Max. output (hotwater)	*-U0	min adjustable output - 100%	U0
1.C	Pump map (heating) (combi only) (see section 3.3.1, **1.C/1.d**)	00-05	0 Pump step adjustable 1 Constant pressure high 2 Constant. pressure middle 3 Constant pressure low 4 Proportional pressure high 5 Proportional pressure low	04
1.d	Map pump step (heat.) (combi only)	02-07	2-7	07
1.E	Pump switch mode	01-03	1 - 3	02
2.b	Max. flow temperature	35-88	35 - 88°C	88°C
2.C	Air purge mode (burner keeps off while air purge mode is on)	00-02	0 off 1 on, automatic deactivation (on for 8 minutes, then off) 2 permanent on	01
2.F	Operating mode	00-02	0 Normal 1 Minimal (for 15 min) 2 Maximal (for 15 min)	00
3.b	Anti-cycle time	00-15	0 - 15 min	03 min
3.C	Anti-cycle flow temperature differential	00-30	0-30 K (Note: 1K ≙ 1 °C)	10 K
3.E	Pre heat cycle time (hot water) (combi only)	20-60	20 - 60 min	20 min
3.F	Burner off after DHW demand (hot water) (combi only)	00-30	0 - 30 min (0 = 10sec)	01 min
4.F	Siphon-fill programme	00-01	0 off , 1 on, boiler min.output	01
5.A	Reset service reminder	00	0 must be stored in order to reset service reminder	00
5.b	Fan over-run time	01-18	1-18 (= 10 sec - 180 sec)	03 (30 sec)
6.A	Last fault	00 - FF	last fault code can be displayed	00
6.d	Actual flow rate turbine (combi only)	00-99	0-99 l/min	read only

Table 3

	Description	Display	Range adjustable from - to/ Description	Reset Value (after parameter reset)
6.E	Programmer input	00-11	00, 01, 10, 11 (left digit: heating, right digit: hotwater)	read only
7.A	Fault indicator LED on/off	00-01	0 off 1 on Flashes in case of error even when its setting is off (0).	01

Table 3

3.2 Second service level (going in the first service level and pressing buttons eco and simultaneously for 3 sec)

	Description	Display	Range adjustable from - to/ Description	Reset Value (after parameter reset)
8.A	Software version	CF ** **	-	read only
8.b	Code plug n°.	-- ** **	1000-4000; corresponds to digits n°. 7 up to 10 of order n°.; example: 8 714 41**1 062** 0	read only
8.C	GFA status (not applicable)	-	-	read only
8.d	GFA error (not applicable)	-	-	read only
8.E	Reset all parameters	00	0 (must be stored in order to set all parameters to factory settings)	00
8.F	Permanent ignition	00-01	0 = off 1 = on (Do not run for more than 2 minutes!)	00
9.A	Operation mode permanent	00-02	0 normal 1 min 2 max	00
9.b	Actual fan speed	*..** (Hz)	-	read only
9.C	Actual heat output	** (%)	0-U0	read only
9.d	Start fan speed	45-55	45-55 Hz	50 Hz
9.E	Turbine signal delay (combi only)	02-08	2-8 [quarter seconds] (corresponds to 0,5-2 sec)	04 (corresponds to 1 sec)
9.F	Pump over-run time (CH mode)	00-03	0-3 min	03

Table 4

3.3 Explanation of service functions

3.3.1 First service level

1.A Max. output (heating)

The heating output can be set to any level between min. rated heat output and max rated heat output to limit it to the specific heat requirements.

Even if the heating output is limited, the full rated heat output remains available for hot water.

The factory setting is maximum rated output – it depends on appliance type.

1.b Max. output (hotwater)

The hotwater output can be set to any level between min. rated hotwater output and max rated hotwater output to limit it to the specific hotwater requirements.

The factory setting is maximum rated output – display shows **U0**.

1.C Pump map (heating) (combi only)

The appliance is supplied with this function set to **4** (Proportional pressure high). See pump characteristics below.

The pump map indicates how the pump is controlled in heating mode. The pump switches between the various pump speeds so as to reproduce the characteristic curve selected.

Changing the pump characteristic can be helpful if a lower pressure difference will guarantee the necessary circulation on the basis of the system dimensions and pump characteristic.

In order to save as much energy as possible and to minimise the possibility of water circulation noise, a low characteristic should be chosen.

The pump map can be selected within:

- **0** (Pump step adjustable), see service function **1.d** (Map pump step (heating))
- **1** (Constant pressure high)
- **2** (Constant pressure middle)
- **3** (Constant pressure low)
- **4** (Proportional pressure high)
- **5** (Proportional pressure low).

The factory setting is:

1.C Pump map (heating) **4** (Proportional pressure high)

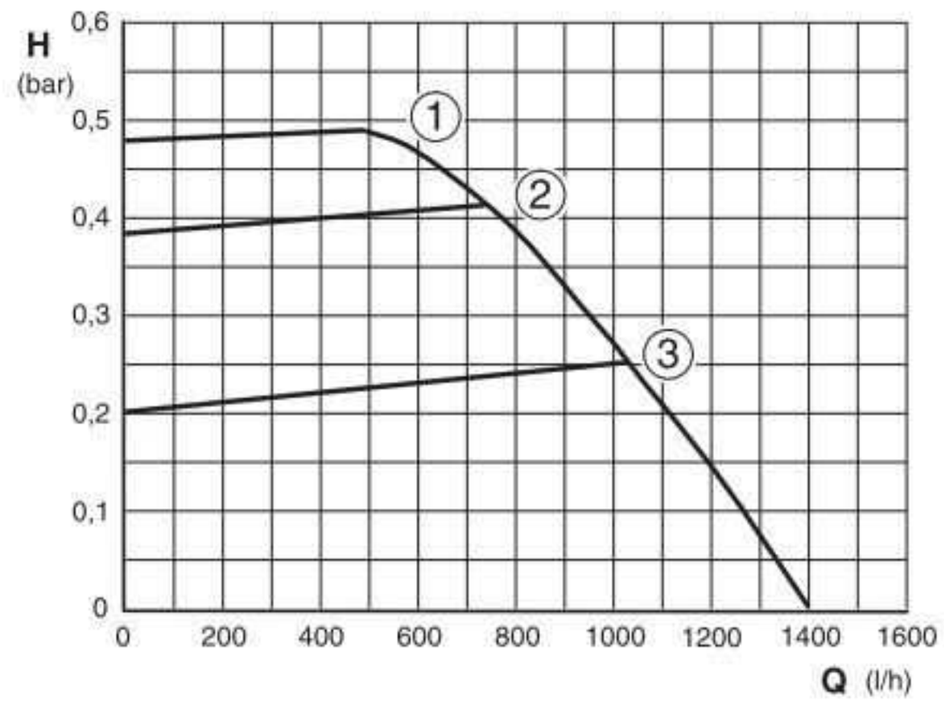

Fig. 5 Constant pressure

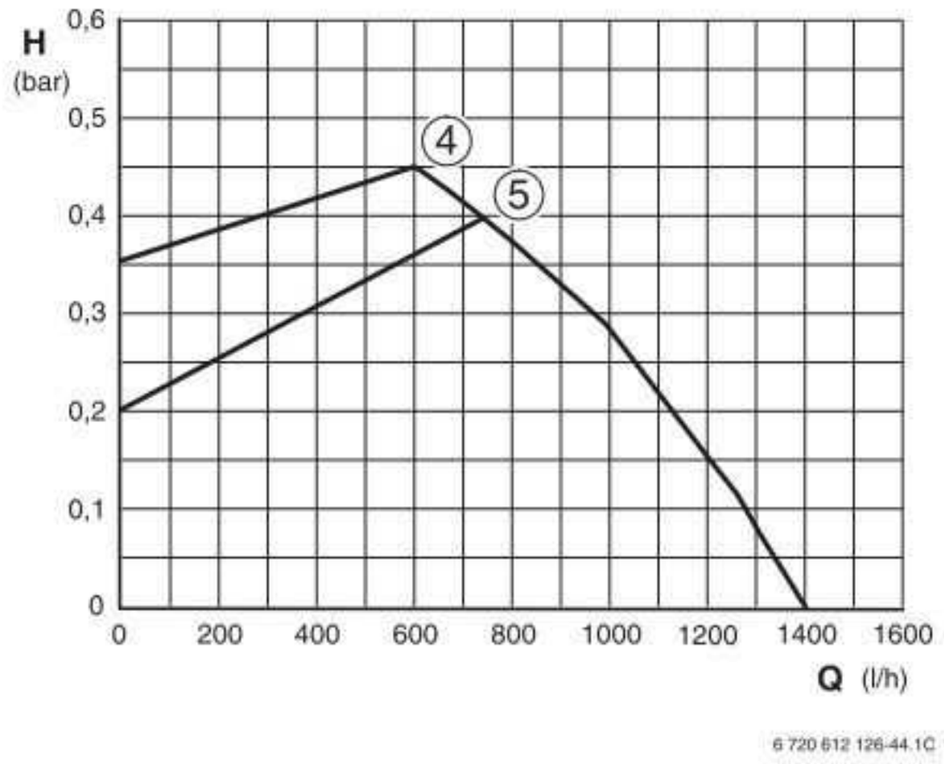

Fig. 6 Proportional pressure

1-5 Caracteristics
H Pressure
Q Water circulation rate

If this parameter is set to **0** then the pump speed set under function **1.d** (Map pump step (heating)) is active.

1.d Map pump step (heating) (combi only)

This service function corresponds to the pump speed switch used on conventional heating pumps.

However, the setting is only active if function **1.C** (Pump map (heating)), is set to **0**.

The factory setting is:

1.d Map pump step (heating) **7**

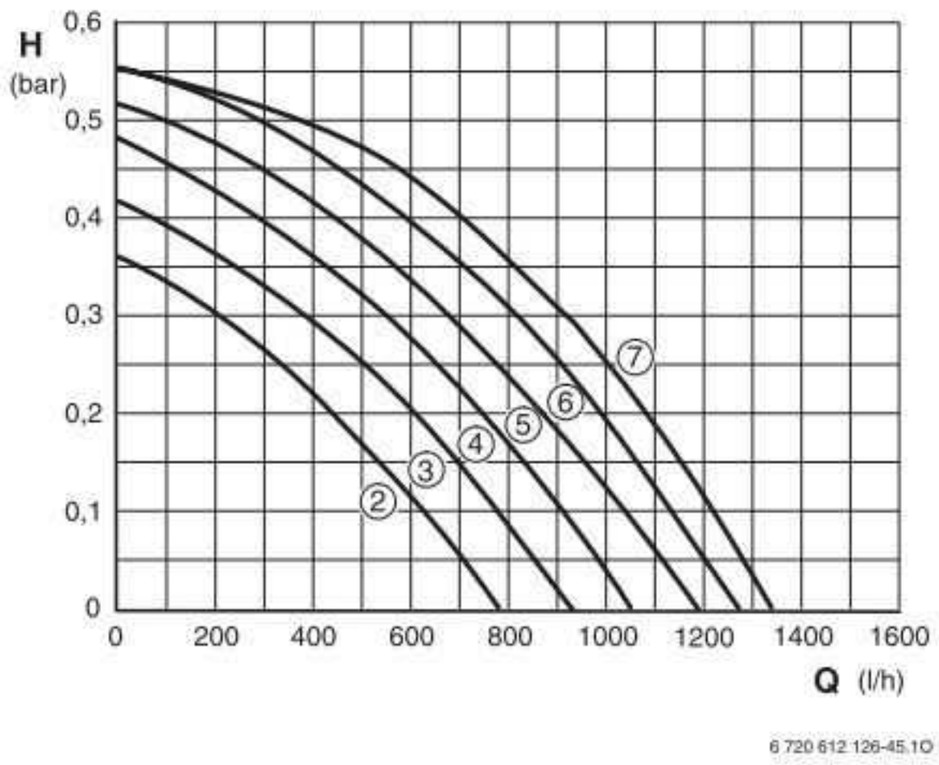

Fig. 7 Caracteristics

2-7 Caracteristics
H Pressure
Q Water circulation rate

1.E Pump switch mode

The choice of settings is as follows:

- **Control Mode 1**
  For heating equipment without a control unit.
  The pump is controlled by the central heating flow temperature control.
- **Control Mode 2 (factory setting)**
  For heating systems with room thermostat.
  The central heating flow temperature control controls only the gas, the pump is not affected. The room thermostat controls both the gas and the pump.
  The pump and fan have an over-run time of between 15 s and 3 min.
- **Control Mode 3**
  Not applicable.

2.b Max. flow temperature

The maximum CH flow temperature can be set to between 35°C and 88°C (factory setting). Even if the CH flow temperature control is set higher, the setting entered for **2.b** (Max. flow temperature) is not exceeded.

2.C Air purge mode

The first time the appliance is switched on, a once-only venting function is activated. The heating pump then switches on and off at intervals. This sequence lasts about 8 minutes.
The 2-digit display shows ⊏⊐ in alternation with the CH flow temperature.
The automatic vent must be opened and then closed again once the venting sequence is complete.

> The venting function can be activated manually after servicing.

- If the venting function is set to "On" (with automatic deactivation), the function is set to "Off" once the sequence has been completed.

2.F Operating mode

There are 3 operating modes to choose from.

- **Normal mode**: the appliance operates according to the commands received from the programmer. The display shows **0**.
- **Minimal mode**: the appliance runs constantly at minimum output.
  The display shows **1**. The 2-digit display alternates between the CH flow temperature and ⊏⊐. After 15 min the minimal mode changes to normal mode.
- **Maximal mode**: the appliance runs constantly at maximum output.
  The display shows **2**. The 2-digit display alternates between the CH flow temperature and ⊐⊏. After 15 min the maximal mode changes to normal mode.

3.b Anti-cycle time

The anti-cycle time is factory set to 3 minutes.

The shortest possible anti-cycle time is 1 minute (recommended for single-pipe and hot-air heating systems).

If the setting 0 is entered, the anti-cycle time is inactive.

▶ Enter the anti-cycle time on the commissioning record enclosed with the appliance.

3.C Anti-cycle flow temperature differential

The switching difference is the permissible differential from the specified CH flow temperature. It can be set in increments of 1 K. The adjustment range is 0 to 30 K (is factory set to 10 K). The minimum CH flow temperature is 35°C.

> Note: 1K ≙ 1 °C.

▶ The switching difference setting should be entered on the commissioning record supplied with the appliance.

3.E Cycle time (hot water) (combi only)

The appliance is supplied with the pre-heat cycle time set to 20 minutes.
After pre-heating or DHW demand, this function will stipulate the period of time before the next permissible pre-heat. This will prevent excessive pre-heat cycling.

3.F Burner off after DHW demand (hot water) (combi only)

The appliance is supplied with the hot water duration set to 1 minute.

The hot water duration specifies how long after hot water is drawn heating mode remains disabled.

4.F Siphon-fill programme

The trap filling programme ensures that the condensation trap is filled when the appliance is first installed or after it has been shut down for a long period: The condensation trap prevents flue gas escaping from the appliance into the room in which it is installed.

The trap filling programme is activated:

- the appliance is switched on at the master switch
- the burner has not been in operation for at least 48 hours
- the appliance is switched from summer to winter mode.

The next time the heating or hot water system calls for heat, the appliance is held at minimum output for 15 minutes. The trap filling programme remains active until the appliance has completed 15 minutes of operation at minimum output.
The 2-digit display alternates between -|- and the CH flow temperature.

If the condensation trap is not filled, flue gas can escape!

- ▶ Only deactivate the trap filling programme in order to carry out servicing work.
- ▶ Always re-activate trap filling programme once servicing is complete.

5.A Reset service reminder

The burner service intervall of 2324 hours has run out. After the service inspection store 0 for resetting the service intervall.

5.b Fan over-run time

Set the time of fan over-run after a boiler demand.

6.A Last fault

The last fault can also be recalled for servicing purposes when the appliance is functioning correctly.

6.d Actual flow rate turbine (combi only)

The actual flow rate of the turbine is displayed.

6.E Programmer input

Shows the status of channel 1 of the timer DT10/20. Left digit is “Heat demand”, heating mode will be activated according to the programmer commands.

Shows the status of channel 2 of the timer DT20. Right digit is “DHW demand”, hot water mode will be activated according to the programmer commands.

7.A Fault indicator LED on/off

The fault indicator LED flashes in case of error even when its setting is off (0).

3.3.2 Second service lvel

8.A Software version

The version number of the software is displayed.

8.b Code plug

The 4-digit part number of the code plug (digits n°. 7 up to 10 of order n°.) is indicated.
The code plug determines the appliance functions. If the appliance is converted from natural gas to LPG or vice versa (using conversion kit) the code plug also has to be changed.

8.C GFA status

(not applicable)

8.d GFA error

(not applicable)

8.E Reset all parameters

Set all parameters to factory setting. See also section 2.6.

8.F Permanent ignition

This function allows permanent ignition without gas supply to be activated for the purposes of checking the ignition mechanism.

Do not run for more than 2 minutes!

9.A Operation mode permanent

Set a fixed operation mode even when boiler has been switched off.

9.b Actual fan speed

The current fan speed is displayed in Hertz (Hz).

9.C Actual heat output

The actual heat output of the appliance at the time viewed is displayed.

9.d Start fan speed

The actual start fan speed between 45 and 55 Hz is displayed in Hertz (Hz).

9.E Turbine signal delay (combi only)

Set a delay time relates to the beginning of DHW demand to avoid an undesired demand by water surge hammer.

9.F Pump over-run time (CH mode)

Set the time of pump over-run after the end of a heating demand.

4 Rectifying faults

4.1 Indication of faults

Faults are indicated simultaneously by a letter code in the display and by flashing of the fault indicator LED. This helps to identify and eliminate the cause of the fault quickly and reliably.

The fault codes displayed are grouped into four categories:

- **Category 1:**
  The appliance is disabled until it has been switched off and then on again.
- **Category 2:**
  The appliance is disabled until the cause of the fault has been eliminated.
- **Category 3:**
  The appliance continues to operate with limited function.
- **Category 4:**
  The appliance is disabled and locked (button **reset** and fault indicator LED are flashing) until the cause of the fault has been eliminated and the appliance unlocked.

Unlocking the appliance:

▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. (See also section 2.1).

4.2 Summary

4.2.1 Appliance faults

Appliance faults	Category	conventional boiler	combi boiler	Page
A1	1	X	X	18
A7	3	X	X	19
b1	2	X	X	20
C6	2	X	X	21
E2	2	X	X	22
E9	4	X	X	23
EA	4	X	X	26
F0	2/4	X	X	30
F7	4	X	X	31
FA	4	X	X	32
Fd	4	X	X	33

Table 5

4.2.2 Faults that are not displayed

Appliance faults	conventional boiler	combi boiler	Page
Excessive burner noise, rumbling noises	X	X	34
Flow noises	X	X	35
Heating up of last radiators in system too slow	X	X	35
Flue gas levels incorrect, CO level too high	X	X	36
Ignition too harsh, ignition poor	X	X	37
Condensation in the flue pipe	X	X	38
Inadequate hot water outlet temperature (combi boiler)		X	39

Table 6

Programmer faults	Page
Set room temperature not reached (DT10/DT20)	40
Set room temperature exceeded by large amount (230 V On/Off room stat)	40
Excessive fluctuations in room temperature (230 V On/Off room stat)	41

Table 7

4.3 Notes on using the fault code tables

The procedure is best described with the aid of an example:

- Work through the table from top to bottom and from left to right.
- First make a note of the present settings and restore them before leaving the appliance.
- Read question **1.** (Check column)and depending on the answer (yes or no) read the action required from the relevant box and carry out the instruction given; ignore the other answer. **For example:** if the burner flame is visible, follow the instructions for **yes**, i.e. ↓5.!
- ↓5. means go to number 5., ignoring the steps in between.

In this example: check the flue is clear by testing the CO_2 level.

- If the appliance is locked (button **reset** and the fault indicator LED are flashing), press the **reset** button.
- If the fault has been rectified, the appliance will then start up without indicating a fault and the fault isolation procedure is complete.
- If the fault is still present after performing the action specified and, if necessary, restarting the appliance, move on to the next step in the fault isolation procedure.
- If another fault code is displayed, work through the fault code table for that code.

Flame not detected

	Check		Action
1.	Is a burner flame visible?	**yes:**	↓ 5.
		no:	↓ 2.
2.	Is the gas cock turned on?	**yes:**	Ø 5.
		no:	▸ Open the gas cock. ▸ Press button ⏢. EA? ↓3.
3.	Has the thermal cut-out on the gas cock tripped?	**yes:**	...
		no:	↓ ...
4. ...	...		
5. ...	Problem with flue? ▸ Check CO_2 level in combustion air. Is CO_2 level above 0,2 % ...	**yes:**	Check flue.
		no:	↓ ...

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Fig. 8 Example of fault code table

4.4 Error codes on the display

A1 and fault indicator LED are flashing.

Controlled-characteristic pump has run dry

	Check		Action
1.	System pressure below 1.2 bar?	**yes:**	▶ Power OFF the appliance. ▶ Check appliance and system for water leaks and repair as necessary. ▶ Fill system, bleed and re-pressurise (see Installation Instructions). ▶ Turn ON the appliance. A1? ↓2.
		no:	↓2.
2.	Pump seized or sticking?	**yes:**	Free/release pump.
		no:	↓3.
3.	Audible bearing damage on pump?	**yes:**	▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Drain appliance. ▶ Change the pump (see Installation Instructions). ▶ Fill system, bleed and re-pressurise (see Installation Instructions). ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ↓4.
		no:	↓4.
4.	Activate venting sequence.	**yes:**	▶ Select in the first service level the service function **2.C** (Air purge mode). ▶ Select the value **1** and store. ▶ Exit the service function. ▶ The appliance vents itself for 8 minutes. ▶ Vent radiators manually.

A7 and fault indicator LED are flashing.

(Boiler still produces hot water but at a lesser degree of accuracy over the temperature.)

Water NTC sensor defective.

	Check		Action
1.	▶ Check if the water NTC connector corroded[1)], damaged or dirty.	**yes:**	▶ Change relative parts. A7?↓2.
		no:	↓2.
2.	▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Un-plug 20-pin connector from PCB. ▶ Check resistance from connections 3 to 4 on the cable side. Does the value match the ones described in table 9, page 42?	**yes:**	▶ Connect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Make a note of the altered service function settings (see table 3 on page 11) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.
		no:	↓3.
3.	▶ Un-plug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 9, page 42?	**yes:**	▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	▶ Change NTC sensor. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.

1) For notes, refer to Appendix

b1 and fault indicator LED are flashing.

Code plug not detected.

	Check		Action
1.	► Select in the second service level the service function **8.b** (Code plug). ► Compare number displayed with that shown in Appendix (only digits n°. 7 up to 10 of order n°.). No number or incorrect number displayed. ► Exit the service function.	**yes:**	↓2.
		no:	↓3.
2.	Code plug loose, incorrect or defective.		► Power OFF the appliance. ► Fit code plug (correctly), making sure code number is correct (see Appendix). ► Turn ON the appliance. b1? ↓3.
3.	The PCB control board is damaged.		► Make a note of the altered service function settings (see table 3 on page 11) in order to keep the altered values. ► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change PCB control board. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Restore service settings previously noted down.

C6 and fault indicator LED are flashing.

Fan speed too low

	Check		Action
1.	Fan lead connector properly connected?	**yes:**	↓2.
		no:	▸ Power OFF the appliance. ▸ Plug in connector. ▸ Turn ON the appliance. C6? ↓2.
2.	Check power supply to appliance, check supply with all electrical appliances on. Is the supply strong enough (230 V AC)?	**yes:**	↓3.
		no:	▸ Switch off some electrical appliances. ↓3.
3.	Is fan lead defective? ▸ Power OFF the appliance. ▸ Disconnect the boiler electrical connection. ▸ Measure the fan lead for continuity. Is there continuity for each one of the cores?	**yes:**	↓4.
		no:	▸ Replace fan lead. ▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. C6? ↓4.
4.	Fan defective.	**yes:**	▸ Power OFF the appliance. ▸ Disconnect the boiler electrical connection. ▸ Un-plug the connection wire. ▸ Replace fan. ▸ Plug the connection wire. ▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. C6? ↓5.
5.	The PCB control board is damaged.		▸ Make a note of the altered service function settings (see table 3 on page 11) in order to keep the altered values. ▸ Power OFF the appliance. ▸ Disconnect the boiler electrical connection. ▸ Change PCB control board. ▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. ▸ Restore service settings previously noted down.

E2 and fault indicator LED are flashing.

The flow temperature NTC sensor defect.

	Check		Action
1.	▶ Check if the flow temp. NTC connector corroded[1)], damaged or dirty.	**yes:**	▶ Change relative parts. E2?↓2.
		no:	↓2.
2.	▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Un-plug 20-pin connector from PCB. ▶ Check resistance from connections 8 to 9 on the cable side. Does the value match the ones described in table 9, page 42?	**yes:**	▶ Connect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Make a note of the altered service function settings (see table 3 on page 11) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.
		no:	↓3.
3.	▶ Un-plug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 9, page 42? ▶ Reconnect the boiler electrical connection.	**yes:**	▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	▶ Change NTC sensor.

1) For notes, refer to Appendix

E9 and button reset and fault indicator LED are flashing.

Safety temperature limiters has tripped.

	Check		Action
1.	Type of CH system: Is the appliance installed in a fully pumped sealed system?	**yes:**	↓3.
		no:	↓2.
2.	Open vented CH system: Is there enough water in the feed and expansion tank?	**yes:**	↓4.
		no:	▸ Top up system. ▸ Vent appliance. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓4.
3.	Fully pumped sealed system: Is the heating pressure between 1 and 2 bar (sealed systems)?	**yes:**	↓4.
		no:	▸ Top up system. ▸ Vent appliance. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓4.
4.	Is the pump seized?	**yes:**	▸ Free/release the pump. If pump won't start: ▸ Power OFF the appliance. ▸ Disconnect the boiler electrical connection. ▸ Drain appliance. ▸ Change the pump (see Installation Instructions). ▸ Fill system, bleed and re-pressurise (see Installation Instructions). ▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓5.
		no:	↓5.
5.	Lead disconnected from flue safety temperature limiter and/or CH flow safety temperature limiter?	**yes:**	▸ Power OFF the appliance. ▸ Reconnect lead. ▸ Turn ON the appliance. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓4.
		no:	↓4.

Error E9

E9 and button reset and fault indicator LED are flashing.

Safety temperature limiters has tripped.

	Check		Action
4.	► Power OFF the appliance. ► Un-plug the connector from the flue safety temperature limiter. ► Measure the flue safety temperature limiter for continuity. Resistance small?	**yes:**	► Connect flue gas safety temperature limiter lead. ↓5.
		no:	► Change the flue safety temperature limiter. ► Connect flue gas safety temperature limiter lead. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓5.
5.	► Disconnect lead to CH flow safety temperature limiter. ► Measure the CH flow safety temperature limiter for continuity. Resistance small?	**yes:**	► Connect CH flow safety temperature limiter. ↓6.
		no:	► Change CH flow safety temperature limiter. ► Connect CH flow safety temperature limiter. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓6.
6.	► Disconnect the boiler electrical connection. ► Un-plug connector of harness that connects the limiters to PCB from control board. Test harness (including the two limiters) for continuity. Resistance small?	**yes:**	► Re-plug connector. ↓7.
		no:	Harness defective. ► Repair or replace the harness. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓7.
7.	► Disconnect the boiler electrical connection. ► Remove fuse SI 3 from appliance PCB control board and test for continuity. Resistance small?	**yes:**	► Remount the fuse. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ↓8.
		no:	► Change the fuse. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. E9? ↓8.

E9 and button reset and fault indicator LED are flashing.

Safety temperature limiters has tripped.

	Check		Action
8.	The PCB control board is damaged.		▶ Make a note of the altered service settings (see table 3 on page 11). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

Error EA

EA and button reset and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
1.	Is a burner flame visible?	**yes:**	↓5.
		no:	↓2.
2.	Is the gas cock turned on?	**yes:**	↓3.
		no:	▸ Open the gas cock. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓3.
3.	Is there air in the supply pipe?	**yes:**	▸ Vent supply pipe. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓4.
		no:	↓4.
4.	**Natural gas models**: messure gas supply at gas valve. Is the pressure OK according to technical data?	**yes:**	▸ Is correct code plug fitted? If not, fit correct code plug (see Appendix). ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓5.
		no:	▸ Check working pressure at appliance to eliminate pipewirk problems. ▸ Check pressure at the building supply pressure regulator, inform gas company if outside correct range. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓5.
	LPG models: is the flow rate of the gas supply to the appliance correct?	**yes:**	↓5.
		no:	▸ Is there enough gas in the supply cylinder? ▸ Is there air in the supply pipe? ▸ Is the supply pressure OK? (if supply pressure outside correct range, inform gas supplier) ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓5.
5.	▸ Power OFF the appliance. ▸ Disconnect the boiler electrical connection. Is the earth connection correct?	**yes:**	▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. ↓6.
		no:	▸ Correct the electrical connection. ▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓6.

EA and button reset and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
6.	Is the condensate trap blocked?	**yes:**	▸ Clean out condensation trap discharge pipe. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓7.
		no:	↓7.
7.	Is diaphragm in air/gas manifold fitted correctly (see installation instructions)? ▸ Open air/gas manifold. ▸ Check diaphragm for correct orientation, soiling and splitting. Is diaphragm OK?	**yes:**	▸ Close air/gas manifold (see installation instructions). ↓8.
		no:	▸ Insert diaphragm in the fan intake tube as per installation instructions so that the flaps open upwards. ▸ Close air/gas manifold (see installation instructions). EA? ↓8.
8.	Check the gas valve. ▸ Power OFF the appliance. ▸ Un-plug the connectors from the gas valve. ▸ Measure the gas valve coils **I** and **II** electrical resistance . R = 164±40 Ω? ▸ Remove gas valve and check inlet filter for blockage.	**yes:**	▸ Reconnect the connectors. ▸ Turn ON the appliance. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓9.
		no:	▸ Turn off gas cock. ▸ Disconnect the boiler electrical connection. ▸ Change the gas valve. ▸ Open the gas cock. ▸ Reconnect the connectors. ▸ Reconnect the boiler electrical connection. ▸ Turn ON the appliance. ▸ Check appliance for leaks. ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓9.
9.	Problem with flue? ▸ Open up heat exchanger - is it dirty? ▸ Check CO_2 level in combustion air in the flue (with outer casing fitted). Is CO_2 level above 0,2 % ?	**yes:**	▸ Check flue installation for agreement with the instruction manual. **Then:** ▸ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓10.
		no:	↓10.

EA and button reset and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
10.	Is flue gas CO_2 level incorrect[1)]?	**yes:**	▶ Adjust to correct level. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓11.
		no:	↓11.
11.	▶ Select in the second service level the service function **8.F** (Permanent ignition). ▶ Select the value **1** and store. Check the permanent ignition at the electrodes (without gas). Is it OK?	**yes:**	▶ Select the value **0** and store. ▶ Exit the service function. ↓12.
		no:	▶ Select the value **0** and store. ▶ Exit the service function. ↓15.
12.	Ignition lead connected to ignition electrodes?	**yes:**	↓13.
		no:	▶ Reconnect lead. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓13.
13.	Ignition cable connector engaged in switchbox?	**yes:**	↓14.
		no:	▶ Power OFF the appliance. ▶ Engage ignition cable connector in switchbox. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓14.
14.	Is the ignition electrical wire damaged?	**yes:**	▶ Power OFF the appliance. ▶ Change the ignition electrical wire. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓15.
		no:	↓15.
15.	Electrode assembly defective? ▶ Power OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out or cracked?	**yes:**	▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓16.
		no:	▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓16.

EA and button reset and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
16.	► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Check if the 20-pin connector lead assembly is damaged.		► Change the 20-pin connector lead assembly. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. EA? ↓17.
17.	The PCB control board is damaged.		► Make a note of the altered service settings (see table 3 on page 11). ► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change PCB control board. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Restore service settings previously noted down.

1) See installation instructions

Error F0

F0 **and fault indicator LED (and possibly button reset) are flashing.**

Internal failure

	Check		Action
1.	Button **reset** flashing?	**yes:**	▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. ▶ Initiate demand for heat by pressing button for 10 sec and then press again after 30 seconds to cancel. ▶ Initiate two more demands for heat as above. F0? ↓2.
		no:	↓2.
2.	The PCB control board is damaged.		▶ Make a note of the altered service settings (see table 3 on page 11). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

F7 and button reset and fault indicator LED are flashing.

Although appliance switches off, flame still detected

	Check		Action
1.	Electrode(s) dirty or defective? ► Power OFF the appliance. ► Remove electrode assembly and bracket and check for wear, deposits and mechanical damage.	**yes:**	► Replace electrode assembly. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. F7? ↓2.
		no:	► Refit electrode assembly. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. F7? ↓2.
2.	Problem with flue? ► Check CO_2 level in combustion air in the flue (with outer casing fitted). Is CO_2 level above 0,2 % ?	**yes:**	There is flue in the combustion air. ► Check flue and repair or replace if necessary. F7? ↓3.
		no:	↓3.
3.	The PCB control board is damaged.		► Make a note of the altered service settings (see table 3 on page 11). ► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change PCB control board. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Restore service settings previously noted down.

Error FA

FA and button reset and fault indicator LED are flashing.

After appliance switches off flame is detected

	Check		Action
1.	Is the condensate trap blocked?	**yes:**	▶ Power OFF the appliance. ▶ Clean out condensate trap discharge pipe. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. FA? ↓2.
		no:	↓2.
2.	Electrode assembly defective? ▶ Power OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out?	**yes:**	▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. FA? ↓3.
		no:	↓3.
3.	Problem with flue? ▶ Check CO_2 level in combustion air in the flue (with outer casing fitted). Is CO_2 level above 0,2 % ?	**yes:**	There is flue in the combustion air. ▶ Check flue, clean if necessary. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. FA? ↓4.
		no:	↓4.
4.	Is the gas valve damaged?	**yes:**	▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Turn off gas cock. ▶ Change the gas valve. ▶ Open the gas cock. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Check appliance for leaks. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. FA?↓5.
		no:	↓5.

FA and button reset and fault indicator LED are flashing.

After appliance switches off flame is detected

	Check		Action
5.	► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Check if the 20-pin connector lead assembly is damaged.		► Change the 20-pin connector lead assembly. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. FA? ↓6.
6.	The PCB control board is damaged.		► Make a note of the altered service settings (see table 3 on page 11). ► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change PCB control board. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Restore service settings previously noted down.

Fd and button reset and fault indicator LED are flashing.

Reset button pressed inadvertently

	Check		Action
1.	**reset** button flashing?		► Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. Fd? ↓2.
2.	The PCB control board is damaged.		► Make a note of the altered service settings (see table 3 on page 11). ► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change PCB control board. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Restore service settings previously noted down.

4.5 Faults that are not displayed

4.5.1 Appliance faults

Excessive burner noise, rumbling noises			
	Check		**Action**
1.	Does the gas supply type match the specifications on the appliance identification plate?	**yes:**	↓2.
		no:	▸ Convert appliance to correct gas type. Rumbling noises? ↓2.
2.	▸ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	**yes:**	↓3.
		no:	▸ De-commission appliance. Natural gas models: ▸ Notify gas company.
3.	Problem with flue? ▸ Check CO_2 level in combustion air in the flue (with outer casing fitted). Is CO_2 level above 0,2 % ?	**yes:**	There is flue in the combustion air. ▸ Check flue and repair or replace if necessary. Rumbling noises? ↓4.
		no:	↓4.
4.	Is appliance's internal air/flue channel leaking or blocked? ▸ Open up heat exchanger and inspect. ▸ Check control pressure at test point as stated in installation instructions. ▸ Remove silencer, flue duct and air flow limit. ▸ Open trap and inspect. Air channels dirty/clogged, seals defective or not correctly fitted?	**yes:**	▸ Repair or replace components. ▸ Grease seal before fitting. Make sure it is fitted in correct position. Rumbling noises? ↓5.
		no:	↓5.
5.	▸ Measure CO_2 levels. CO_2 levels in flue gas at min and max output do not match figures specified in installation instructions.	**yes:**	▸ Adjust CO_2 level as per installation instructions.
		no:	▸ Power OFF the appliance. ▸ Turn off gas cock. ▸ Change the gas valve. ▸ Open the gas cock. ▸ Turn ON the appliance. ▸ Check appliance for leaks.

Flow noises			
	Check		**Action**
1.	Pump map/pump step incorrect?		Combi appliances: ▸ Set appropriate pump map/pump step (service function **1.C/1.d**). Conventional appliances: ▸ Set appropriate pump velocity on pump.

Heating up of last radiators in system too slow			
	Check		**Action**
1.	Pump map/pump step incorrect?		Combi appliances: ▸ Set appropriate pump map/pump step (service function **1.C/1.d**). Conventional appliances: ▸ Set appropriate pump velocity on pump.

Flue gas levels incorrect, CO level too high			
	Check		**Action**
1.	Does the gas supply type match the specifications on the appliance identification plate?	**yes:**	↓2.
		no:	▸ Convert appliance to correct gas type. Flue gas levels **incorrect**? ↓2.
2.	▸ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	**yes:**	↓3.
		no:	▸ De-commission appliance. Natural gas models: ▸ Notify gas company.
3.	Problem with flue? ▸ Check CO_2 level in combustion air in the flue (with outer casing fitted). Is CO_2 level above 0,2 % ?	**yes:**	There is flue in the combustion air. ▸ Check flue and repair or replace if necessary. Flue gas levels **incorrect**? ↓4.
		no:	↓4.
4.	Flue gas CO_2 levels measured at min. and max. load do not match specified levels? ▸ Measure CO_2 levels.	**yes:**	▸ Adjust CO_2 level as per installation instructions. Flue gas levels **incorrect**? ↓5.
		no:	↓5.
5.	Gas rate too high when CO_2 level correctly set.	**yes:**	▸ Reduce gas rate by means of adjusting screw on gas valve and/or gas flow restrictor. ▸ Check CO_2 adjustment. Flue gas levels **incorrect**? ↓6.
		no:	↓6.
6.			▸ Power OFF the appliance. ▸ Turn off gas cock. ▸ Change the gas valve. ▸ Open the gas cock. ▸ Turn ON the appliance. ▸ Check appliance for leaks.

Ignition too harsh, ignition poor			
	Check		**Action**
1.	▶ Select in the second service level the service function **8.F** (Permanent ignition). ▶ Select the value **1** and store. Check the permanent ignition at the electrodes (without gas). Is it OK?	**yes:**	▶ Select the value **0** and store. ▶ Exit the service function. ↓6.
		no:	▶ Select the value **0** and store. ▶ Exit the service function. ↓2.
2.	Ignition lead connected to ignition electrodes?	**yes:**	↓3.
		no:	▶ Connect cable to ignition electrodes. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. Ignition poor? ↓3.
3.	Ignition cable connector engaged in switchbox?	**yes:**	↓4.
		no:	▶ Power OFF the appliance. ▶ Engage ignition cable connector in switchbox. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. Ignition poor? ↓4.
4.	Is the ignition electrical wire damaged?	**yes:**	▶ Power OFF the appliance. ▶ Change the ignition electrical wire. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. Ignition poor? ↓5.
		no:	↓5.
5.	Electrode assembly defective? ▶ Power OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out?	**yes:**	▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. Ignition poor? ↓6.
		no:	▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press the **reset** button for 3 sec and release it. After releasing the appliance re-starts. Ignition poor? ↓6.

Ignition too harsh, ignition poor			
	Check		**Action**
6.	Does the gas supply type match the specifications on the appliance identification plate?	**yes:**	↓7.
		no:	▸ Convert appliance to correct gas type. Ignition poor? ↓7.
7.	▸ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	**yes:**	↓8.
		no:	▸ De-commission appliance. In case of natural gas: ▸ Notify gas company.
8.	Problem with flue? ▸ Check CO_2 level in combustion air in the flue (with outer casing fitted). Is CO_2 level above 0,2 % ?	**yes:**	There is flue in the combustion air. ▸ Check flue and repair or replace if necessary. Ignition poor? ↓9.
		no:	↓9.
9.	Flue gas CO_2 levels measured at min. and max. load do not match specified levels? ▸ Measure CO_2 levels.	**yes:**	▸ Adjust CO_2 level as per installation instructions. Ignition poor? ↓10.
		no:	↓10.
10.	Burner not correctly fitted or defective? ▸ Power OFF the appliance. ▸ Turn off gas cock. ▸ Remove burner. Cover fixings not tight **or** seal defective or not correctly fitted **or** burner defective?		▸ Replace burner and seal if necessary. ▸ Ensure seal is fitted in correct position. ▸ Open the gas cock. ▸ Turn ON the appliance. ▸ Check appliance for leaks.

Condensation in the flue pipe			
	Check		**Action**
1.	Is diaphragm in air/gas manifold fitted correctly (see installation instructions)? ▸ Open air/gas manifold. ▸ Check diaphragm for correct orientation, soiling and splitting.		▸ Fit diaphragm as per installation instructions or replace. ▸ Close air/gas manifold (see installation instructions).

Inadequate hot water outlet temperature (combi boiler)			
	Check		**Action**
1.	Pump does'nt turn? ► Un-plug connector from pump; is voltage between terminal 1 and terminal 3 on connector 230 V AC?	**yes:**	► Try to start pump. ► If not sucessfull, change pump.
		no:	↓2.
2.	► Compare flow rate from boiler with showed flow rate in service function **6.d.** Are they equal?	**yes:**	↓3.
		no:	► Change turbine.
3.	► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Un-plug connector from Heatronic; ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Is voltage between terminal 1 and terminal 3 on Heatronic 230 V AC?	**yes:**	► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change the lead assembly. ► Reconnect the boiler electrical connection. ► Turn ON the appliance.
		no:	► Make a note of the altered service settings (see table 3 on page 11). ► Power OFF the appliance. ► Disconnect the boiler electrical connection. ► Change PCB control board. ► Reconnect the boiler electrical connection. ► Turn ON the appliance. ► Restore service settings previously noted down.

4.5.2 Programmer faults

Set room temperature not reached (DT10/DT20)			
	Check		**Action**
1.	Thermostatic valve(s) set too low?	**yes:**	▸ Turn up thermostatic valve(s). ↓2.
		no:	↓2.
2.	Set time periods for channel 1 at the timer DT10/20 correct?	**yes:**	↓3.
		no:	▸ Correct the time periods for channel 1.
3.	Check the channel 1 at DT10/20 with the service function **6.E**. Is the left digit set to 1?	**yes:**	↓4.
		no:	▸ Change DT10/20.
4.	CH flow temperature control on boiler set too low?	**yes:**	▸ Turn up CH flow temperature control. ↓5.
		no:	↓5.
5.	Air in the heating system.		▸ Power OFF the appliance. ▸ Check appliance and system for water leaks and repair as necessary. ▸ Top up system. ▸ Turn ON the appliance. ▸ Select in the first service level the service function **2.C** (Air purge mode). ▸ Select the value **1** and store. ▸ Exit the service function. ▸ The appliance vents itself for 8 minutes. ▸ Vent radiators manually.

Set room temperature exceeded by large amount (230 V On/Off room stat)			
	Check		**Action**
1.	Do radiators get too hot?	**yes:**	▸ Decrease setting of “Heating” control. ↓2.
		no:	↓2.

Set room temperature exceeded by large amount (230 V On/Off room stat)			
	Check		**Action**
2.	Bad choice of location for programmer, e.g. outside wall, near window, in draught, on hollow wall, etc.	**yes:**	▸ Select better installation location. or ▸ Fit external room thermostat. ↓3.
		no:	↓3.
3.			▸ Turn down thermostatic valve(s).

Excessive fluctuations in room temperature (230 V On/Off room stat)			
	Check		**Action**
1.	Bad choice of location for programmer, e.g. outside wall, near window, in draught, on hollow wall, etc.		▸ Select better installation location.

5 Appendix

5.1 NTC values, temperature limiter values

5.1.1 Flue sensor

Flue temperature (°C) Measurement tolerance ±10%	Resistance (Ω)
20	124 900
40	53 290
60	24 890
80	12 550
100	6 777
120	3 873
140	2 328
160	1 455
180	948
200	540

Table 8

5.1.2 CH flow NTC sensor and hot water NTC sensor

Temperature (°C) Measurement tolerance ±10%	Resistance (Ω)
20	14 772
25	11 981
30	9 786
35	8 047
40	6 653
45	5 523
50	4 608
55	3 856
60	3 243
65	2 744
70	2 332
75	1 990
80	1 704
85	1 464
90	1 262
95	1 093
100	950

Table 9

5.2 Fan speed ranges

Appliance	Fan speed ranges (Hz)
25 CDi N.G.	29 - 78
30 CDi N.G.	29 - 94
35 CDi N.G.	29 - 104
40 CDi N.G.	31 - 110
25 CDi L.P.G.	32 - 77
30 CDi L.P.G.	32 - 92
35 CDi L.P.G.	32 - 104
40 CDi L.P.G.	32 - 110
30 CDi conventional N.G.	29 - 94
40 CDi conventional N.G.	31 - 110
30 CDi conventional L.P.G.	32 - 92
40 CDi conventional L.P.G.	32 - 110

Table 10

5.3 Electrical wiring diagram

5.3.1 Combi appliances

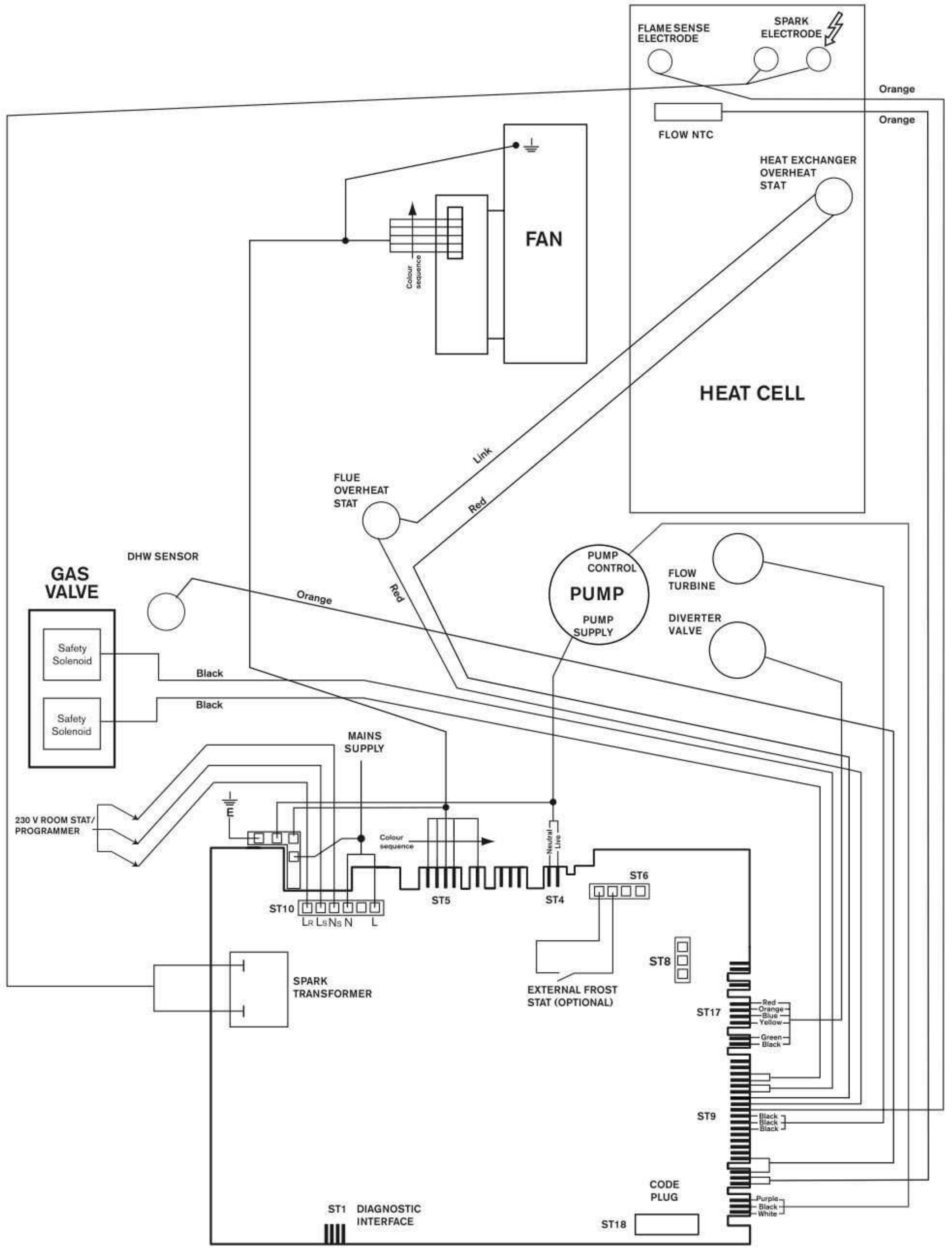

Fig. 9

5.3.2 Conventional appliances

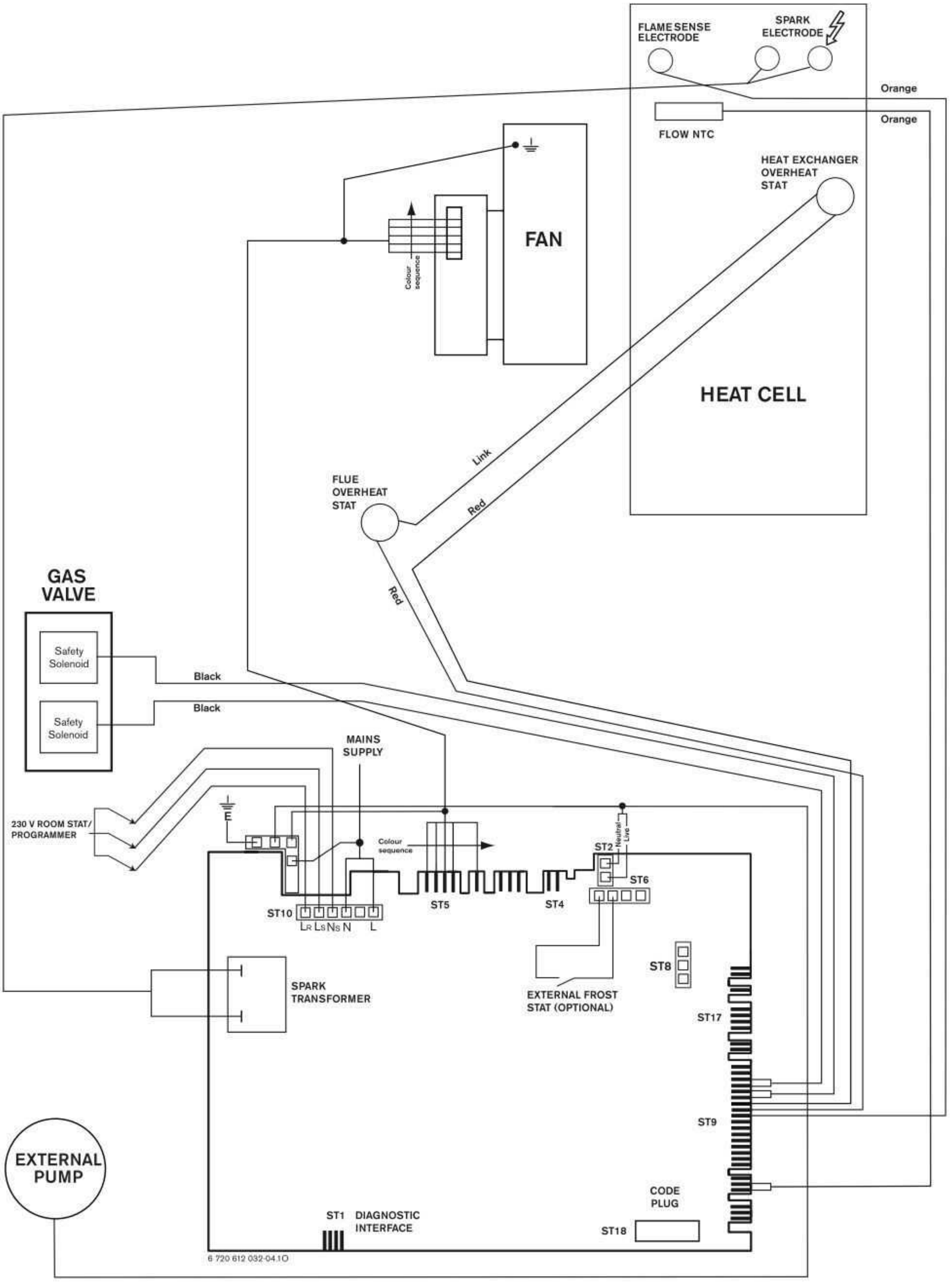

Fig. 10

5.4 Approved corrosion inhibitors and anti-freeze fluids for central heating water

Corrosion inhibiter

The following corrosion inhibiters are permitted:

Manufacturer	Product	Concentration
Fernox	MB 2	1 %

Table 11

Anti-freeze fluid

Please contact Worcester BBT for more information (see rear side).

5.5 List of Code plugs used with this appliance

Component	Order no.	Remarks
Code plug		
25 CDi N.G.	8 714 431 004 0	-
30 CDi N.G.	8 714 431 002 0	
35 CDi N.G.	8 714 431 000 0	-
40 CDi N.G.	8 714 431 006 0	
25 CDi L.P.G.	8 714 431 005 0	-
30 CDi L.P.G.	8 714 431 003 0	
35 CDi L.P.G.	8 714 431 001 0	-
40 CDi L.P.G.	8 714 431 007 0	
30 CDi conventional N.G.	8 714 431 008 0	Mid position diverter valve systems and Zone valves systems
40 CDi conventional N.G.	8 714 431 010 0	
30 CDi conventional L.P.G.	8 714 431 009 0	
40 CDi conventional L.P.G.	8 714 431 011 0	

Table 12

5.6 Summary of BDH Information Sheet on Identifying Corrosion by CFCs

The presence of halogenated hydrocarbons in the combustion air causes surface corrosion on affected metals. Particularly susceptible is the combustion chamber and the heat exchanger surfaces (including stainless steel) as well as the metal components in the flue socket, flue pipe connections and in the chimney.

The halogen compounds present in the combustion air produce highly corrosive hydrochloric acid in the flame and in some cases - depending on the precise composition of the combustion air - hydrofluoric acid, both of which accumulate in the boiler and remain active over long periods.

In order to limit the damage, the source of the air contamination must be located and sealed off. If this is not possible, the combustion air must be drawn from an alternative clean source.

Halogens can occur in the following locations:

Commercial and industrial sources	
Dry cleaners	Trichloroethylene, tetrachloroethylene, fluorinated hydrocarbons
Degreasing baths	Perchloroethylene, trichloroethylene, methyl chloroform
Printers	Trichloroethylene
Hairdressers	Aerosol spray propellants, hydrocarbons containing fluorine and chlorine (freons)
Sources in the home	
Cleaning and degreasing agents	Perchloroethylene, methyl chloroform, trichloroethylene, methylene chloride, carbon tetrachloride, hydrochloric acid
Home workshops	
Solvents and thinners	Various chlorinated hydrocarbons
Spray cans	Chlorofluorohydrocarbons (freons)

Table 13

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FOR THE ENGINEER

EXCELLENCE COMES AS STANDARD

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